

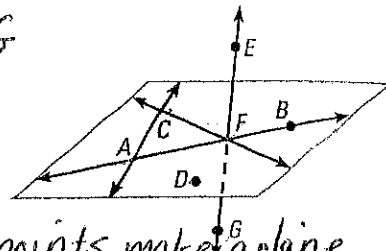
# Extra Practice

## Geometry 201 Midterm Review

### Chapter 1

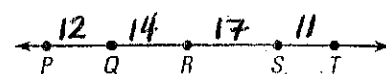
1.1 In Exercises 1-5, use the diagram.

- Name three points that are collinear. Then give a name for the line that contains the points.  $\overleftrightarrow{AB}$   $\overleftrightarrow{EG}$   $\overleftrightarrow{AFB}$  or  $\overleftrightarrow{EFG}$
- Name the intersection of plane  $ABC$  and  $\overleftrightarrow{EG}$ .  $F$
- Name two pairs of opposite rays.  $\overrightarrow{FB}$   $\overrightarrow{FA}$
- Are points  $A$ ,  $C$ , and  $G$  coplanar? Explain. yes, three points make a plane
- Name a line that intersects plane  $AFD$  at more than one point.  $\overleftrightarrow{AF}$



1.2 In the diagram,  $P$ ,  $Q$ ,  $R$ ,  $S$ , and  $T$  are collinear,  $PT = 54$ ,  $QT = 42$ ,  $QS = 31$ , and  $RS = 17$ . Find the indicated length.

- $PQ$  12
- $PS$  43
- $QR$  14
- $PR$  26
- $ST$  11
- $RT$  28



1.2 Point  $B$  is between  $A$  and  $C$  on  $\overline{AC}$ . Use the given information to write an equation in terms of  $x$ . Solve the equation. Then find  $AB$  and  $BC$ , and determine whether  $\overline{AB}$  and  $\overline{BC}$  are congruent.

12.  $AB = x + 3$   
 $BC = 2x + 1$   
 $AC = 10$

$\} \text{congruent}$

13.  $AB = 3x - 7$   
 $BC = 3x - 1$   
 $AC = 16$

14.  $AB = 11x - 16$   
 $BC = 8x - 1$   
 $AC = 78$   
 $\} \text{congruent}$

$x + 3 + 2x + 1 = 10$   $3x = 6$   $x = 2$

15.  $AB = 4x - 5$   
 $BC = 2x - 7$   
 $AC = 54$   $x = 11$   
 $\text{not } \cong$

16.  $AB = 14x + 5$   
 $BC = 10x + 15$   
 $AC = 80$   
 $x = \frac{5}{2}$   
 $\text{congruent}$

17.  $AB = 3x - 7$   
 $BC = 2x + 5$   
 $AC = 108$   $x = 22$ , not  $\cong$

1.3 Find the coordinates of the midpoint of the segment with the given endpoints.

18.  $A(2, -4)$ ,  $B(7, 1)$

19.  $C(-3, -2)$ ,  $D(-8, 4)$

$\left( \frac{2+7}{2}, \frac{-4+1}{2} \right) = \left( \frac{9}{2}, -\frac{3}{2} \right)$   $\left( \frac{-3-8}{2}, \frac{-2+4}{2} \right) = \left( -\frac{11}{2}, 1 \right)$

21.  $G(3, -7)$ ,  $H(-1, 9)$

22.  $I(4, 3)$ ,  $J(2, 2)$

20.  $E(-2, 3)$ ,  $F(3, -9)$

23.  $K(1, 7)$ ,  $L(8, -8)$

1.3 Find the length of the segment with given endpoint and midpoint  $M$ .

24.  $Z(0, 1)$  and  $M(7, 1)$  14

25.  $Y(4, 3)$  and  $M(1, 7)$  10

26.  $X(0, -1)$  and  $M(12, 4)$  26

27.  $W(5, 3)$  and  $M(-10, -5)$  34

28.  $V(-3, -4)$  and  $M(9, 5)$  30

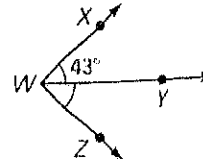
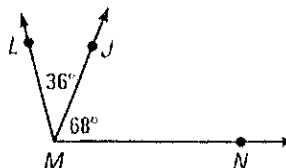
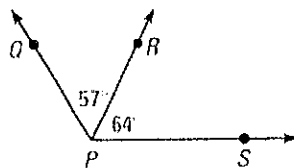
29.  $U(3, 2)$  and  $M(11, -4)$  20

1.4 Use the given information to find the indicated angle measure.

30.  $m\angle QPS = ?$  121°

31.  $m\angle LMN = ?$  104°

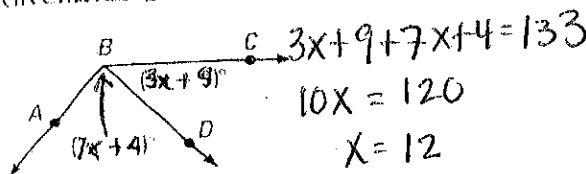
32.  $m\angle XWZ = 86$



26.  $12 = \frac{0+x}{2}$   $x = 24$   $4 = \frac{-1+y}{2}$   $y = 9$  (24, 9)

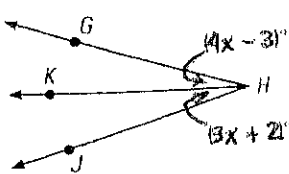
$d = \sqrt{(0-24)^2 + (-1-9)^2} = \sqrt{576+100} = \sqrt{676} = 26$

33. Given  $m\angle ABC = 133^\circ$ , find  $m\angle ABD$ .

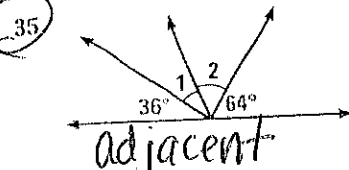


$m\angle ABD = 88$

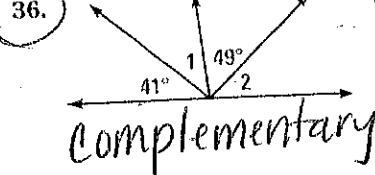
34. Given  $m\angle GHK = 17^\circ$ , find  $m\angle KHF$ .



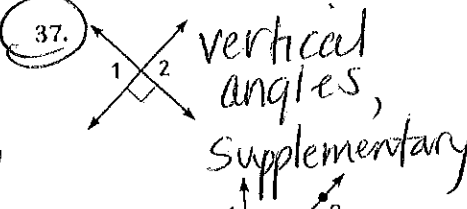
- 1.5 Tell whether  $\angle 1$  and  $\angle 2$  are *vertical angles*, *adjacent angles*, a *linear pair*, *complementary*, or *supplementary*. There may be more than one answer.



adjacent



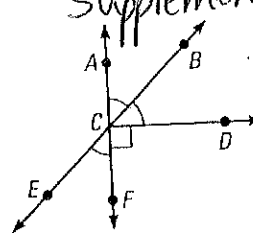
complementary



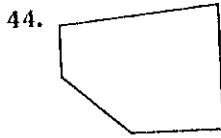
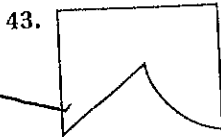
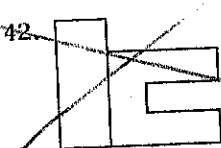
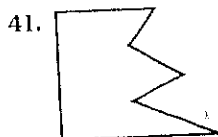
vertical angles, supplementary

1.5 Use the diagram.

38. Name two supplementary angles that are not a linear pair.  
39. Name two vertical angles that are not complementary.  
40. Name three pairs of complementary angles. Tell whether each pair contains vertical angles, adjacent angles, or neither.

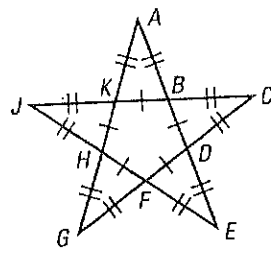


- 1.6 Tell whether the figure is a polygon. If it is not, explain why. If it is, tell whether it is *convex* or *concave*.

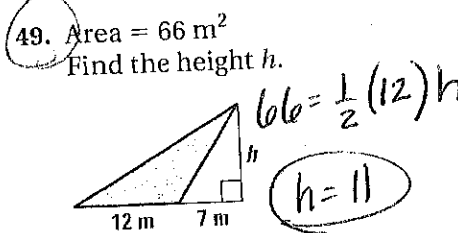
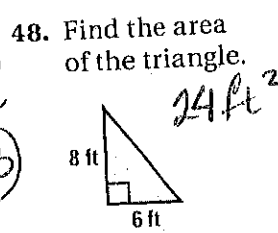
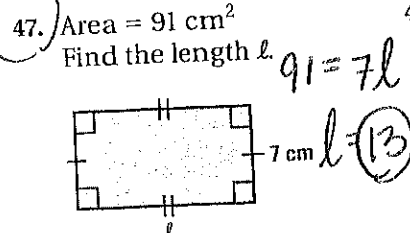


- 1.6 In Exercises 45 and 46, use the diagram.

45. Identify two different equilateral polygons in the diagram. Classify each by the number of sides.  
46. Name one of each of the following figures as it appears in the five-pointed star diagram: triangle, quadrilateral, pentagon, hexagon, heptagon.



- 1.7 Use the information about the figure to find the indicated measure.



- 1.7 Find the perimeter and area of the triangle with the given vertices. Round to the nearest tenth.

50.  $A(2, 1)$ ,  $B(3, 6)$ ,  $C(6, 1)$

51.  $D(1, 1)$ ,  $E(3, 1)$ ,  $F(6, 5)$

Chapter 2 (11) If a figure is a square, then it is a four-sided regular polygon.

2.1 Describe the pattern in the numbers. Write the next number in the pattern. (11) If a figure is a four-sided regular polygon, then it is a square.

1. 17, 23, 15, 21, 13, 19, ...
2. 1, 0.5, 0.25, 0.125, 0.0625, ...
3. 2, 3, 5, 7, 11, 13, ...
4. 7.0, 7.5, 8.0, 8.5, ...
5.  $1, \frac{1}{3}, \frac{1}{9}, \frac{1}{27}, \dots$
6. 2, 2, 4, 6, 10, 16, 26, ...


2.1 Show the conjecture is false by finding a counterexample.

7. The difference of any two numbers is a value that lies between those two numbers.  $-8 - (-5) = -3$
8. The value of  $2x$  is always greater than the value of  $x$ .  $x = 0$
9. If an angle  $A$  can be bisected, then angle  $A$  must be obtuse.  $m\angle A = 90^\circ$

2.2 For the given statement, write the if-then form, the converse, the inverse, and the contrapositive.

- (10) If 2 lines intersect, then they form 2 pairs of vertical angles. *vertical angles*
- (11) All squares are four-sided regular polygons. (10) If 2 lines form 2 pairs of vertical angles, then they intersect.

2.2 Decide whether the statement is true or false. If false, provide a counterexample.

12. If a figure is a hexagon, then it is a regular polygon. False 
13. If two angles are complementary, then the sum of their measures is  $90^\circ$ . True

2.3 Write the statement that follows from the pair of statements that are given.

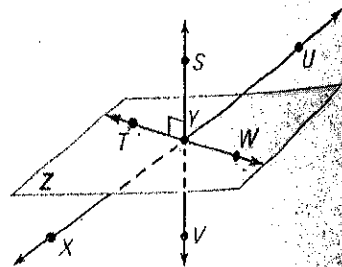
14. If a triangle is equilateral, then it has congruent angles. *14. If a  $\Delta$  is equilateral, then it is regular.*
15. If two coplanar lines are not parallel, then they intersect. *15. If two lines intersect, then they form congruent vertical angles.*
- (15) If 2 coplanar lines are not  $\parallel$ , then they form  $\cong$  vertical  $\angle$ 's.

2.3 Select the word(s) that make(s) the conclusion true.

16. John only does his math homework when he is in study hall. John is doing his math homework. So, John (is, may be, is not) in study hall.
17. May sometimes buys pretzels when she goes to the supermarket. May is at the supermarket. So, she (will, might, will not) buy pretzels.

2.4 Use the diagram to determine if the statement is true or false.

- (18)  $\overleftrightarrow{SV} \perp$  plane  $Z$ . True
- (19)  $\overleftrightarrow{XU}$  intersects plane  $Z$  at point  $Y$ . True
- (20)  $\overleftrightarrow{TW}$  lies in plane  $Z$ . True
- (21)  $\angle SYT$  and  $\angle WYS$  are vertical angles. False
- (22)  $\angle SYT$  and  $\angle TYV$  are complementary angles. False
- (23)  $\angle TYU$  and  $\angle UYW$  are a linear pair. True
- (24)  $\angle UYW$  is acute. False



2.5 Solve the equation. Write a reason for each step.

25.  $4x + 15 = 39$

26.  $6x + 47 = 10x - 9$

27.  $2(-7x + 3) = -50$

28.  $54 + 9x = 3(7x + 6)$

29.  $13(2x - 3) - 20x = 3$

30.  $31 + 25x = 7x - 14 + 3x$

2.6 Copy and complete the statement. Name the property illustrated.

31. If  $m\angle JKL = m\angle GHI$  and  $m\angle GHI = m\angle ABC$ , then  $m\angle JKL = m\angle ABC$  Transitive Prop of  $=$

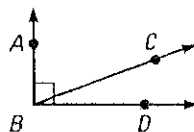
32. If  $m\angle MNO = m\angle PQR$  then  $m\angle PQR = m\angle MNO$  Symmetric Prop of  $=$

33.  $m\angle XYZ = m\angle XYZ$  Reflexive Prop of  $=$

2.6 34. Copy and complete the proof.

**GIVEN** ▶ Point C is in the interior of  $\angle ABD$ .  
 $\angle ABD$  is a right angle.

**PROVE** ▶  $\angle ABC$  and  $\angle CBD$  are complementary.



## STATEMENTS

## REASONS

1.  $\angle ABD$  is a right angle.

1. Given

2.  $m\angle ABD = 90^\circ$ 2. def. of right  $\angle$ 3. Pt. C is in the interior of  $\angle ABD$ 

3. Given

4.  $m\angle ABD = m\angle ABC + m\angle CBD$ 

4. Angle Addition Postulate

5.  $90^\circ = m\angle ABC + m\angle CBD$ 

5. Substitution Property of Equality

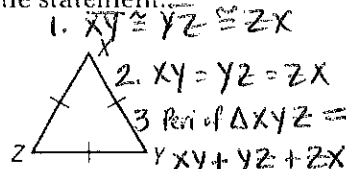
6.  $\angle ABC$  and  $\angle CBD$  are complementary

6. Definition of complementary angles

2.6 35. Use the given information and the diagram to prove the statement.

**GIVEN** ▶  $\overline{XY} \cong \overline{YZ} \cong \overline{ZX}$

**PROVE** ▶ The perimeter of  $\triangle XYZ$  is  $3 \cdot XY$ .



## Statements

## Reasons

1.  $XY \cong YZ \cong ZX$ 

1. Given

2.  $XY = YZ = ZX$ 2. def of  $\cong$ 3. Peri of  $\triangle XYZ =$ 

3. def of perimeter or perimeter formula

4. Peri of  $\triangle XYZ =$ 

4. Substitution

5. Peri of  $\triangle XYZ = 3 \cdot XY$ 

5. Simplify

2.7 Copy and complete the statement.  $\angle AGD$  is a right angle and  $\overleftrightarrow{AB}$ ,  $\overleftrightarrow{CD}$ ,  $\overleftrightarrow{XY}$  and  $\overleftrightarrow{EF}$  intersect at point G.

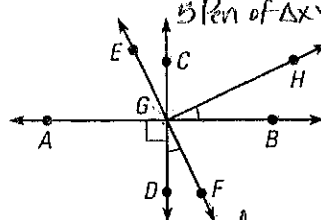
36. If  $m\angle CGF = 158^\circ$ , then  $m\angle EGD = ?$   $158^\circ$

37. If  $m\angle EGA = 67^\circ$ , then  $m\angle FGD = ?$   $23^\circ$

38. If  $m\angle FGC = 149^\circ$ , then  $m\angle EGA = ?$   $59^\circ$

39.  $m\angle DGB = ?$   $90^\circ$

40.  $m\angle FGH = ?$   $90^\circ$



## Statements

## Reasons

1.  $\angle UKV$  and  $\angle VKW$  are complements

1. Given

2.  $\angle UKV$  and  $\angle YKX$  are vert.  $\angle$ 's2. def. of vert.  $\angle$ 's3.  $\angle VKW$  and  $\angle YKZ$  are vert.  $\angle$ 's3. Vert  $\angle$  Theorem4.  $m\angle UKV = m\angle YKX$ ,  $m\angle VKW = m\angle YKZ$ 4. def. of  $\cong$ 5.  $m\angle UKV + m\angle VKW = 90^\circ$ 

5. def of complementary

6.  $m\angle YKX + m\angle YKZ = 90^\circ$ 

6. Substitution

2.7 41. Write a two-column proof.

**GIVEN** ▶  $\angle UKV$  and  $\angle VKW$  are complements.

**PROVE** ▶  $\angle YKZ$  and  $\angle XKY$  are complements.

If  $\angle YKZ$  and  $\angle XKY$  are complements,  
 def. of complementary  $\angle$ 's